

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-162565

(43)Date of publication of application : 19.06.1998

(51)Int. Cl.

G11B 33/02

(21)Application number : 08-319431 (71)Applicant : NEC HOME ELECTRON LTD

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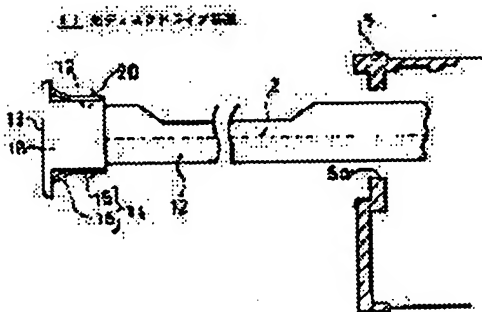
## (54) OPTICAL DISK DRIVE DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an optical disk drive device with a high dustproof effect and a simple configuration.

SOLUTION: A front surface plate 13 with a size for covering a tray withdrawal port 5a, a holder part 18 that projects on the rear surface of the front surface plate 13, and a dustproof material 14, where a flat part 16 is engaged to the holder part 18 while leaving a deflection deformation margin, and the flap part 16 is included between the open edge part of the tray withdrawal port 5a and the rear surface of the front surface plate 13 in a disk drive device for preventing dust/dirt from entering an enclosure 5, are provided at a loading tray 12 that reciprocates between a disk-mounting device and a disk-driving device via the tray withdrawal port 5a inside and outside the enclosure 5 for accommodating the drive

mechanism 3 of an optical disk 2. The maintenance of rustproof performance and the drive mechanism for the loading tray 12 and the load suppression for the power supply can be managed simultaneously.



## PRIOR ART

[Description of the Prior Art] Revolution actuation of the optical disk was carried out,

and the frontloading method with which the optical disk drive equipment which performs record or playback by the optical pickup arranged the loading device in the front section of an equipment housing which holds a drive device occupies most. By this kind of front loading tray method, a loading tray is taken in and out of the front face of a housing through the tray outlet which carries out opening, and an optical disk can be conveyed now between the disk stowed position besides a housing, and the disk activation point in a housing. The perspective view in which drawing 5 shows an example of conventional optical disk drive equipment, and drawing 6 are the important section side elevations of the optical disk drive equipment shown in drawing 5.

[0003] The optical disk drive equipment 1 shown in drawing 5 carries out revolution actuation of the optical disk 2 which is a record medium according to the drive device 3, it considers as the configuration which minds an optical pickup 4, and records or reproduces a signal, and the body is held in the flat box-like housing 5. Tray outlet 5a for the loading tray 6 which conveys an optical disk 2 between a disk stowed position and a disk activation point is carrying out opening to housing 5 front face. A loading tray 6 consists of base plate 6a, side-face plate 6b of the couple really formed in the both sides of base plate 6a, and front plate 6c really formed in the front end of base plate 6a. The disk receipt crevice of a major diameter is engraved on base plate 6a more slightly than the outer diameter of an optical disk 2, an optical disk 2 is laid and restricted support is carried out. Loading devices (not shown), such as a pinion rack device in which a loading tray 6 is conveyed within and without housing 5, are attached to side-face plate 6b. Front plate 6c serves to cover tray outlet 5a and to prevent trespass of dust while preventing the elutriation of the optical disk 2 from base plate 6a. It is an advice way for radial to scan [ an optical pickup 4 ] 6d. The optical disk 2 guided to the disk activation point in a housing 5 is pinched between chucking pulley 3a attached to the turntable in which rise-and-fall actuation is carried out by the elevator style (not shown) in one with an optical pickup 4, and clamper plate 3b which counters this, and revolution actuation is carried out with a turntable.

[0004] By the way, as the protection-against-dust material 7 which consists of a spring material is fixed in the tooth back of front plate 6c prepared at loading tray 6 head and it was shown in drawing 6, when it engages with the engagement slot 8 where this protection-against-dust material 7 surrounds opening of tray outlet 5a of a housing 5 and a loading tray 6 is in a disk activation point, it prevents that dust invades in a housing 5 from the clearance between tray outlet 5a. That is, if it is in the condition that the loading tray 6 was held in the housing 5 interior, between housing 5 front face and front plate 6c is blockaded by the protection-against-dust material 7, and the airtightness of a housing 5 is maintained.

## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates the easy protection-against-dust material of structure to the optical disk drive equipment which raised installation and protection-against-dust nature at the loading tray of an optical disk.

[0002]

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[0005]

[Problem(s) to be Solved by the Invention] Since the above-mentioned conventional optical disk drive equipment 1 was sticking the protection-against-dust material 7 on the tooth-back part of front plate 6c of a loading tray 6, When the gap has been made according to the installation tolerance of a loading tray 6 between the protection-against-dust material 7 and the engagement slot 8 In the condition of sufficient protection-against-dust effectiveness not being acquired, and the low DIGU tray 6 being in the housing 5 interior, and carrying out revolution actuation of the optical disk 2 The technical problem that an excessive load was exerted on a sake to a loading device occurred that energizing a loading tray 6 must be continued to a housing 5 back side for airtight maintenance. Furthermore, since the protection-against-dust material 7 was stuck on the tooth-back periphery section of front plate 6c with a slight attachment area with the double-sided tape, it was what holds the technical problem that the working capacity at the time of installation is very bad.

[0006] This invention solves the above-mentioned technical problem, and installation of protection-against-dust material is easy, and it aims at offering the optical disk drive equipment which can moreover obtain the high protection-against-dust engine performance.

[0007]

[Means for Solving the Problem] The drive device in which this invention carries out revolution actuation of the optical disk, and an optical pickup performs record or playback in order to solve the above-mentioned technical problem, The housing in which holds this drive device and a tray outlet carries out opening to a front face, In optical disk drive equipment equipped with the loading tray which held said inside and outside of a housing free [ reciprocation ] between the disk stowed position and the disk activation point through said tray outlet Said loading tray said tray outlet The front plate of wrap magnitude, A part bends, and leave deformation allowances to the

holder section which protruded on the tooth back of this front plate, and this holder section, and it is fitted in them. It is characterized by providing the protection-against-dust material which said part intervenes in said disk activation point between the opening edge of said tray outlet, and the tooth back of said front plate, and prevents trespass of the dust into said housing.

[0008] Moreover, it is characterized by for the wedge-shaped engagement projection protruding on two or more places, for said protection-against-dust member extending further from that the engagement hole with which said protection-against-dust material engages with said engagement projection, and achieves positioning and an omission stop is drilled in two or more places, the tube-like object which fits loosely into said tray outlet, and this tube-like object, and said holder section possessing said flap section which becomes a part etc.

[0009]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained with reference to drawing 1 thru/or drawing 5 . The decomposition perspective view showing the modification of the protection-against-dust material part which showed the decomposition perspective view of the protection-against-dust material part which showed the important section side elevation in which drawing 1 shows 1 operation gestalt of the optical disk drive equipment of this invention, and drawing 2 to drawing 1 , and drawing 3 to drawing 2 , and drawing 4 are the important section perspective views showing the modification of protection-against-dust material.

[0010] The optical disk drive equipment 11 shown in drawing 1 improves the structure of the protection-against-dust material 14 arranged in the tooth back of the front plate 13 attached in the front face of a loading tray 12, and it elaborates the tooth-back configuration of the front plate 13 so that the protection-against-dust material 14 of a parenthesis can equip easily. The protection-against-dust material 14 really casts flexible sheets, such as chlorination plastic sheeting, and a polyester film sheet or a rubber sheet, to box-like, and as shown in drawing 2 , it consists of the rectangular-head tubed duct section 15 in which a transverse plane and a tooth back carry out opening, and the flap section 16 of four sheets prolonged from the duct section 15. vertical side-face of two sheets 15b short to level side-face 15a and length of two sheets with the oblong duct section 15 -- having -- \*\*\*\* -- level side-face 15a -- near at the right end of the left -- respectively -- the engagement hole 17 -- moreover -- vertical side-face 15b -- the -- the engagement hole 17 is mostly drilled in the center.

[0011] On the other hand, the rectangular-head tubed holder section 18 to which the duct section 15 of the protection-against-dust material 14 is fixed by extrapolation

fitting has protruded on the tooth back of the front plate 13. This holder section 18 is what was really formed in the front plate 13 by molding, it has protruded and, as for the direction of the wedge of the engagement projection 20, the wedge-shaped engagement projection 20 has turned [ tongue-shaped piece / 19 / which is rich in the elasticity formed near / corner / each / of four corners ] to the direction of a tooth back of the front plate 13.

[0012] When attaching the protection-against-dust material 14, the right pair of the transverse-plane opening of the duct section 15 of the protection-against-dust material 14 is first carried out to a part for opening of the holder section 18, and the duct section 15 is stuffed into the holder section 18 with a position as it is. To a total of six engagement holes 17, the duct section 15 is pushed in until the engagement projection 20 of the holder section 18 is engaged altogether. When all engagement projections 20 let a wedge-shaped slideway slide and finish engaging with the engagement hole 17, the protection-against-dust material 14 is firmly fixed to the tooth back of the front plate 13. Moreover, the flap section 16 of four sheets prolonged from the duct section 15 at this time confronts each other through the space which a head is stopped by the tooth back of the front plate 13, and bends and serves as allowances with each field of the holder section 18, with flexibility maintained.

[0013] In this way, when fitting immobilization of the protection-against-dust material 14 is carried out at the tooth back of the front plate 13 and conveyance actuation of the loading tray 12 is carried out from a disk stowed position to a disk activation point. In conveyance termination, the flap section 16 intervenes between the opening edge of tray outlet 5a, and the tooth back of the front plate 13, and between the opening edge of tray outlet 5a and the tooth backs of the front plate 13 is airtightly closed because the flap section 16 bends and deforms. The resiliency accompanying bending deformation of the flap section 16 is very small, therefore the force in which you make it discharge a loading tray 12 from a disk activation point hardly needs to energize a loading device in the actuation condition always in order for there to be nothing, therefore to hold a loading tray 12 to a disk activation point.

[0014] According to the above-mentioned optical disk drive equipment 11, thus, the inside and outside of a housing 5 which held the drive device 3 of an optical disk 2 To the loading tray 12 which reciprocates between a disk stowed position and a disk activation point through tray outlet 5a, tray outlet 5a The front plate 13 of wrap magnitude, The flap section 16 bends, and leave deformation allowances to the holder section 18 which protruded on the tooth back of the front plate 13, and the holder section 18, and it is fitted in them. Since the protection-against-dust material 14 which the flap section 16 intervenes in a disk activation point between the opening edge of tray outlet 5a and the tooth back of the front plate 13, and prevents trespass of the dust

into a housing 5 was prepared and constituted When a loading tray 12 is in a disk activation point, a part of protection-against-dust material 14 which carried out fitting wearing bends and deforms into the holder section 18 of front plate 13 tooth back, and are close to the opening edge of tray outlet 5a of housing 5 front face. Trespass of the dust from the outside can be prevented and the load control to maintenance of the protection-against-dust engine performance, the drive for a loading tray 12, or its source of power can be reconciled. Since it is fixed only by it being unnecessary to energize the low DIGU tray 12 to the midst which is carrying out revolution actuation of the optical disk 2 at a housing 5 back side, and to maintain airtightness, and fitting the protection-against-dust material 14 in front plate 13 tooth back, Installation is dramatically easy and the attachment activity with the bad efficiency of sticking the protection-against-dust material 7 on the tooth-back periphery section of front plate 6c with a small attachment area using a double-sided tape like before is unnecessary. And a protection-against-dust function can be achieved firmly, without being influenced by the constraint on the structure of the front plate 13, the installation tolerance of a loading tray, etc.

[0015] Moreover, since the engagement hole 17 which protrudes the wedge-shaped engagement projection 20 on two or more places, engages with the engagement projection 20 at the protection-against-dust material 14, and achieves positioning and an omission stop in the holder section 18 was drilled in two or more places While being able to make the holder section 18 and the protection-against-dust material 14 fitted in this coalesce after it positioned and escaped and the stop has been carried out to the engagement projection 20 by engagement of the engagement hole 17, and this assembling and aiming at large improvement in the workability at the time The repeat of receipts and payments of a loading tray 12 and the omission of the protection-against-dust material 14 which originate in violent handling etc. somewhat can be prevented certainly.

[0016] Furthermore, since the protection-against-dust material 14 extends from the duct section 15 which fits loosely into tray outlet 5a, and the duct section 15 and possesses said flap section 16 which becomes a part, The protection-against-dust material 14 really formed by molding from flexible sheets, such as chlorination plastic sheeting, and a polyester film sheet or a rubber sheet, etc. is used. The dustproof structure which harnessed the flexibility of the flap section 16 in the hermetic-seal part enough can be made, the superfluous burden to the drive of a loading tray 12 can be mitigated, and the good protection-against-dust engine performance can be demonstrated.

[0017] In addition, although the tongue-shaped piece 19 in which elastic deformation is possible was formed in the holder section 18 which protruded on the tooth back of

the front plate 13 and the wedge-shaped engagement projection 20 was considered as the protruding configuration with the above-mentioned operation gestalt at this tongue-shaped piece 19, the wedge-shaped engagement projection 30 direct to each field of the rectangular-head tubed holder section 28 like the optical disk drive equipment 21 which shows an important section to drawing 3 may be made to protrude. Moreover, since the installation nature of protection-against-dust material is raised, like the protection-against-dust material 34 shown in drawing 4, slitting 35a of the depth to about 1/3 can be formed in a part for the connection of each side face of the duct section 35, and it can also consider as the configuration to which the extension range of the flap section 36 at the time of installation is expanded.

[0018]

[Effect of the Invention] As explained above, according to this invention, the inside and outside of a housing which held the drive device of an optical disk To the loading tray which reciprocates between a disk stowed position and a disk activation point through a tray outlet, a tray outlet The front plate of wrap magnitude, A part bends, and leave deformation allowances to the holder section which protruded on the tooth back of a front plate, and the holder section, and it is fitted in them. a disk activation point -- setting -- this, when a loading tray is in a disk activation point since the part prepared and constituted the protection-against-dust material which intervenes between the opening edge of a tray outlet, and the tooth back of a front plate, and prevents trespass of the dust into a housing In order for a part of protection-against-dust material which carried out fitting wearing to bend and deform into the holder section on the tooth back of a front plate, to be close to the opening edge of the tray outlet of the front face of a housing and to prevent trespass of the dust from the outside, The load control to maintenance of the protection-against-dust engine performance, the drive for a loading tray, or its source of power can be reconciled. Since it is fixed only by it being unnecessary to energize a low DIGU tray at a housing back side to the midst which is carrying out revolution actuation of the optical disk, and to maintain airtightness, and fitting protection-against-dust material in a front plate tooth back, Installation is dramatically easy and the attachment activity with the bad efficiency of sticking protection-against-dust material on the tooth-back periphery section of a front plate with a small attachment area using a double-sided tape is unnecessary. And the effectiveness which was [ achieve / firmly / a protection-against-dust function ] excellent is done so, without being influenced by the constraint on the structure of a front plate, the installation tolerance of a loading tray, etc.

[0019] A wedge-shaped engagement projection is protruded on the holder section at two or more places. Moreover, to protection-against-dust material Since the



engagement hole which engages with an engagement projection and achieves positioning and an omission stop was drilled in two or more places While being able to make the holder section and the protection-against-dust material fitted in this coalesce after it positioned and escaped and the stop has been carried out to the engagement projection by engagement of an engagement hole, and this assembling and aiming at large improvement in the workability at the time The effectiveness of being able to prevent certainly the repeat of receipts and payments of a loading tray and the omission of protection-against-dust material which originate in violent handling etc. somewhat is done so.

[0020] Furthermore, since protection-against-dust material extends from the tube-like object which fits loosely into a tray outlet, and a tube-like object and possesses said flap section which becomes a part, The protection-against-dust material really formed by molding from flexible sheets, such as chlorination plastic sheeting, and a polyester film sheet or a rubber sheet, etc. is used. The dustproof structure which harnessed the flexibility of the flap section in the hermetic-seal part enough can be made, the superfluous burden to the drive of a loading tray is mitigated, and the effectiveness of being able to demonstrate the good protection-against-dust engine performance is done so.

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